Appl. No.

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## AMENDMENTS TO THE CLAIMS

1. (Original) A catalyst for producing aliphatic polycarbonate, comprising a rare-earth coordination compound with the formula:

 $MX_nY_m$ 

:

wherein, M is a rare earth element selected from the group consisting of Y, La, Ce, Pr, Nd, Sm. Eu, Gd. Tb, Dy, Ho, Er, Tu, Yb, Lu, and a mixture of two or more of the rare earth element; X is a carboxylic acid group or sulfonic acid group with Ka values above  $10^{-3}$ ; Y is selected from the group consisting of -Cl, -NO<sub>2</sub>, =O, -OH; n and m is dependently an integer from 0 to 3;

an alkyl metal compound, wherein the metal is zinc, magnesium or aluminum, and the alkyl group is selected from the group consisting of CH<sub>3</sub>-, CH<sub>3</sub>CH<sub>2</sub>-, CH<sub>3</sub>CH<sub>2</sub>-, (CH<sub>2</sub>)<sub>2</sub>CH-, CH<sub>3</sub>CH<sub>2</sub>CH<sub>2</sub>-, (CH<sub>2</sub>)<sub>2</sub>CHCH<sub>2</sub>-, and CH<sub>3</sub>CH(CH<sub>3</sub>)CH<sub>2</sub>-;

a polyol selected from the group consisting of ethylene glycol, diethylene glycol, triethylene glycol, 1,2-propanediol, 1,3-propanediol, glycerin and a mixture thereof; and

a carbonate selected from the group consisting of ethylene carbonate, propylene carbonate, cyclohexylene carbonate and a mixture thereof.

- 2. (Original) The catalyst of claim 1, wherein the carboxylic acid group or sulfonic acid group is selected from the group consisting of trifluoroacettic group, trichloroacetic group, dichloroacetic group, chloroacetic group, o-chlorobenzoic group,  $\alpha$ -tartaric acid group, benzene sulfonic acid group, naphthalene sulfonic acid group and a mixture of one or more of them.
- 3. (Original) The catalyst of claim 1, wherein the rare earth metal element is yttrium or neodymium.
- 4. (Original) The catalyst of claim 1, wherein the carboxylic acid group of the rare earth coordination compound is trifluoroacetic group, trichloroacetic group or dichloroacetic group.
  - 5. (Original) The catalyst of claim 1, wherein Y is -Cl or -OH.

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6. (Original) The catalyst of claim 1, wherein the metal alkyl metal is zinc, and alkyl group is CH<sub>2</sub>CH<sub>2</sub>-, CH<sub>3</sub>CH<sub>2</sub>- (CH<sub>2</sub>)<sub>2</sub>CH<sub>-</sub>, or CH<sub>3</sub>CH<sub>2</sub>CH<sub>2</sub>-.

- 7. (Original) The catalyst of claim 1, wherein the polyol is 1,2-propylene glycol, or glycerin.
  - 8. (Original) The catalyst of claim 1, wherein said carbonate is propylene carbonate.
  - 9. (Original) A method for preparing the catalyst of claim 1, comprising the steps of:
    (a) sequentially adding

a polyol selected from the group consisting of ethylene glycol, diethylene glycol, triethylene glycol, 1,2-propandiol, 1,3-propandiol, glycerin and a mixture thereof;

a rare-earth coordination compound of the formula  $MX_nY_m$ , wherein, M is a rare earth element selected from the group consisting of Y, La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tu, Yb, Lu, and a mixture of two or more of the rare earth element; X is a carboxylic acid group or sulfonic acid group with Ka values above  $10^{-3}$ ; Y is selected from the group consisting of -Cl, -NO<sub>2</sub>, =O, -OH; n and m are independently integers from 0 to 3;

and an alkyl metal compound, wherein the metal is zinc, magnesium or aluminum, and the alkyl group is selected from the group consisting of CH<sub>3</sub>-, CH<sub>3</sub>CH<sub>2</sub>-, CH<sub>3</sub>CH<sub>2</sub>CH<sub>2</sub>-, (CH<sub>2</sub>)<sub>2</sub>CH-, CH<sub>3</sub>CH<sub>2</sub>CH<sub>2</sub>-, (CH<sub>2</sub>)<sub>2</sub>CHCH<sub>2</sub>-, and CH<sub>3</sub>CH(CH<sub>3</sub>)CH<sub>2</sub>-;

to the carbonate selected from the group consisting of ethylene carbonate, propylene carbonate, cyclohexylene carbonate and a mixture thereof;

- (b) stirring or grinding the mixture thus obtained;
- (c) aging the mixture for 1-24 hours under 0-50 times atmospheric pressure of nitrogen, argon, carbon dioxide or under supercritical condition.
- 10. (Currently amended) The method of claim 9, wherein the carboxylic acid group or sulfonic acid group of step (a) is selected from the group consisting of trifluoroacetic group.

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trichloroacetic group, dichloroacetic group, chloroacetic group, o-chlorobenzoic\_group. α-tartaric acid group, benzene sulfonic acid group, naphthalene sulfonic acid group and a mixture of one or more of them.

- 11. (Original) The method of claim 9, wherein the mixture in step (c) is aged under the CO<sub>2</sub> atmosphere.
- 12. (Currently amended) A method for preparing aliphatic polycarbonate by using the catalyst of claim 1, comprising the steps of:

adding the catalyst of claim 1 and an epoxide into an autoclave;

filling the autoclave with carbon dioxide and maintaining the pressure between 10-40 atmospheres;

allowing copolymerization reaction to proceed at 60-100°C for 5-24 hours;

adding a HCl/methanol solution, preferably 50% by weight, or an aqueous HCl solution, preferably 5% by weight to terminate the reaction, thus obtaining a polycarbonate.

13. (Original) The method of claim 12, wherein the process is carried out in the absence of solvent.

## Please add the following new claims:

Claim 14. (New) The method of claim 12, wherein the HCl/methanol solution is about 50% by weight.

Claim 15. (New) The method of claim 12, wherein the aqueous HCl solution is about 5% by weight.